

**Oroville Facilities Relicensing Efforts
Environmental Work Group
Draft Narrative Report for Resource Action Discussion**

Resource Action: EWG-84B

Task Force Recommendation Category: 1

**Line Existing Feather River Hatchery Settling Ponds to Prevent Leaching of
Contaminants to the Feather River**

Evaluation Team: Philip Unger and Anita Thompson, reviewed by Eric See and Jerry Boles.

Description of Potential Resource Action Measure:

The existing Feather River Hatchery (FRH) settling ponds would be lined with an impermeable material to prevent leaching of effluent from hatchery operations through the gravel bottom of the ponds. Hatchery wastes, if present, would be removed from the effluent by water treatment facilities. Hatchery operations may produce effluent containing elevated levels of organics, chloride, copper, formaldehyde, and peroxide. If the settling ponds were lined and effluent treated to remove contaminants, a conveyance system would likely be needed to carry water from the settling pond treatment system back to Hatchery Ditch and the Feather River to maintain water in Hatchery Ditch.

Date of Field Evaluation:

Field evaluations were conducted by Phil Unger and Jason Kindopp on June 11, 2003.

Related Resource Actions:

EWG-84A is related to this action because it also addresses the concern that effluent from the hatchery settling ponds potentially impacts Hatchery Ditch and the Feather River.

Nexus to the Project:

The FRH was constructed as mitigation for the loss of upstream habitat and natural salmon and steelhead production that resulted from the construction of the Oroville Facilities. Therefore, effects of the hatchery on water quality must be considered Project effects.

Potential Environmental Benefits:

This measure was proposed because water leaching to Hatchery Ditch from the hatchery settling ponds is potentially contaminated with wastes from hatchery operations. The hatchery settling ponds were constructed on the gravel terrace that forms the north bank of the Feather River. Water from the ponds seeps through the adjacent bank to Hatchery Ditch, which flows into the Feather River. Lining the ponds would eliminate the leaching of water to Hatchery Ditch and the river. Water monitoring under SPW1 identified a high salt load in the settling ponds and Feather River downstream from the hatchery, which shows contaminants in the settling ponds can reach the river. Potentially other contaminants from treating water and fish at the

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hatchery can reach the river and impact aquatic life. SPW1 also found levels of copper exceeding criteria for protection of aquatic life in the ponds and Feather River downstream from the hatchery (but not upstream). Toxicity tests also showed higher toxicity to survival and reproduction of Ceriodaphnia in the settling ponds and downstream from the hatchery than upstream or other stations. No data are available that indicate whether there is an impact to fish or other aquatic organisms actually living in Hatchery Ditch and the Feather River. While criteria designed to protect aquatic life may have been exceeded or toxicity was found to test organisms, this does not necessarily mean that aquatic life in the river are actually impacted. Percolation of the settling pond water through the levee gravels may filter or allow break down of contaminants originally present, thus purifying the water before it enters the ditch. The effluent that leaches from the settling ponds is the principal source of water for Hatchery Ditch, which contains excellent spawning and rearing habitat for steelhead trout. If this source of water were eliminated, a new water source would have to be found for Hatchery Ditch.

Potential Constraints:

The principal potential constraint on this measure is the potential loss of Hatchery Ditch's water supply. Hatchery Ditch is a major habitat for spawning and rearing steelhead trout. Eliminating seepage from the settling ponds to the ditch without providing for a different source of water would most likely destroy this habitat. Other potential constraints include: 1) finding a way to accommodate the build-up of effluent water once the ponds are lined and 2) the high cost of treating the effluent and conveying it back to Hatchery Ditch.

Existing Conditions in the Proposed Resource Action Implementation Area:

The FRH settling ponds currently lie on top of the gravel terrace between the hatchery and the Feather River levee that adjoins the hatchery. They were designed to capture the FRH effluent water to allow solids to settle out. Periodically, the ponds were to be drained and the sediments removed from the bottom of the pond. Currently, FRH effluent flows into the settling ponds and rapidly seeps through the gravel at the bottom of the ponds and into Hatchery Ditch. Percolation of the water through these gravels may filter FRH contaminants (potentially including organics, chloride, copper, formaldehyde and peroxide) from the water. However, data shows that at least some contaminants are not filtered out. The settling pond effluent is a major source of water for Hatchery Ditch.

Hatchery Ditch is a side channel of the Feather River immediately downstream of the FRH. Results of recent sampling indicate that Hatchery Ditch may be the most productive steelhead spawning and rearing habitat in the river. The stream receives much or all of its flow from the leakage of the FRH settling ponds.

Design Considerations and Evaluation:

Major design considerations for the new settling ponds would include how to accommodate the large volume of effluent received from the hatchery and how to

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remove contaminants from the water (water treatment facilities). An especially important design consideration would be to ensure an uninterrupted water supply for Hatchery Ditch. This could be accomplished either by conveying treated water back to the ditch or by developing a new source of water. The new water source could be a channel to carry water from upstream in the Feather River to the Hatchery Ditch. In addition, since contaminants (salt, copper, formaldehyde, etc.) are present only when hatchery water or fish are being treated, another option would be to build a shunt system to divert contaminated water to another holding pond or treatment system (e.g., City of Oroville sewer system) away from the river; “normal” (uncontaminated) hatchery water could still flow to the ponds and subsequently percolate through the gravels to Hatchery Ditch. During the period when contaminated water was unavailable for percolation through the gravels to Hatchery Ditch, a diversion in the plumbing at the hatchery could be made to run river water to the ponds (currently excess flows are returned to the river through a pipe, which could be modified to transport water to the ponds).

The efficacy of this Resource Action would be evaluated by regular water quality monitoring of the treated effluent from the settling ponds before it entered Hatchery Ditch or the river. Finally, DWR’s current monitoring program for steelhead spawning and juvenile rearing should be continued to ensure that any change in the water supplied to the ditch has no adverse effect on the steelhead population.

Synergisms and Conflicts:

This Resource Action is intended to be compatible with the following EWG resource goals: 1) maintain and protect water quality for all beneficial uses, 2) improve habitat for anadromous and resident fish, and 3) minimize hatchery impacts on anadromous salmonids and resident fish. However, as noted previously, there is no evidence that adopting this measure would contribute to any of the goals and, in fact, unless measures are taken to ensure that Hatchery Ditch has an adequate supply of clean water, the action could actually conflict with these resource goals. This Resource Action is similar to, and more restricted than, EWG 84-A.

Uncertainties:

The principal uncertainty of this measure is whether there is a need for it. At present, there is no evidence that the hatchery effluent is harmful to the aquatic life in the river. This uncertainty needs to be resolved before making any change to the settling ponds. Other uncertainties include the volume of hatchery effluent that would need to be treated, and the cost and feasibility of dealing with this volume of water. Also, if this measure required finding an alternate source of water for Hatchery Ditch, it is uncertain where this source would be found. Even if another source were found, it could be difficult to ensure that the existing flow and habitat conditions for steelhead would be maintained. In addition, it has not been determined that a true settling pond is actually needed at the FRH.

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Cost Estimate:

Cost would depend on materials for lining the ponds, method for temporarily diverting effluent while the ponds were being modified, methods for removing contaminants and conveying treated water back to Hatchery Ditch, and the need and procedure for developing a new water supply for Hatchery Ditch. These costs would likely vary, especially if there was a need to install a water conveyance system, and could range from \$100,000 to over \$1,000,000.

Recommendations:

SPW1 identified elevated salt loads and toxicity to test organisms, though this does not necessarily mean that aquatic life in the river is impacted. This resource action should not be evaluated any further. Additional monitoring in the pond and hatchery ditch is recommended (e.g., monitor before and after hatchery treatments to determine how much of the treatment (such as copper, formaldehyde, salt, etc.) reaches the river; and monitor periphyton and invertebrate populations in Hatchery Ditch and compare to populations in the river upstream from the influence of the ponds to determine if hatchery treatments are affecting life in Hatchery Ditch).

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